

Promising Findings on Preschoolers' Emergent Literacy and School Readiness In Arts-integrated Early Childhood Settings

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Abstract An approach to early childhood education that integrates visual and performing arts throughout the preschool curriculum—*Art as a Way of Learning*—was implemented in a program (Promoting and Supporting Early Literacy through the Arts) designed to improve the emergent literacy and school readiness of at-risk young children in community-based preschool settings. A quasi-experimental pre-post treatment-only design was used to explore this program's potential effects in a real-world setting. Preliminary results revealed improvements in young children's emergent literacy on a number of targeted and standardized measures after participation in the program. This arts-integrated approach to the teaching of and learning in young children shows considerable promise and warrants a rigorous test of its effects.

Keywords Emergent literacy · Arts integration · Promoting and supporting early literacy through the arts

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(PASELA) · Art as a way of learning (AWL) ·
Quasi-experimental design

Despite the increasing importance accorded to preschool education—based in part on recent developments in our understanding of early learning and brain development (see Bowman et al. 2001) as well as the long-term benefits for society (Heckman 2006)—the arts typically are not viewed as a critical acquisition during early childhood, as contributing to early learning, or as requiring particular instructional attention. Traditionally the arts are viewed in early childhood education (ECE) simply as brief opportunities for children's creative expression, requiring little intervention by the teacher, and segregated from the bulk of “real” learning available in other parts of the classroom or curriculum (see Bresler 1993). This traditional ECE view of the arts has been augmented indirectly by other contemporary trends that are trickling down from K-12 education (e.g., direct instruction, standardization of academic curricula, accountability via high-stakes testing). We would like to describe a different approach to the arts in ECE—Promoting and Supporting Early Literacy through the Arts (PASELA)—that integrates the arts into all children's learning in all domains, and where early childhood educators and community artists creatively collaborate to ensure school readiness.

The visual and performing arts offer distinct opportunities for young children's growth and development beyond their singular, domain-specific artistic development. Arts-related activities engage representational, communicative, expressive and social capacities that can stimulate new shifts in young children's awareness, perception and thought. These arts-related experiences provide a rich and unique platform from which young children can both understand and prepare for the world around them.

For the young child, of course, a significant portion of that understanding and preparation involves the impending world of kindergarten and formal schooling. Early success in school is affected by the extent to which children enter school “ready to learn,” that is with the necessary cognitive, communicative, motivational and behavioral substrates to facilitate their adjustment to the school environment and to profit from its learning opportunities (Bierman et al. 2008; Campbell and von Stauffenberg 2008; Wesley and Buysse 2003). Early literacy is particularly important among these school-readiness skills because of the reliance on language-mediated instruction and learning in formal schooling.

Emergent literacy, in contrast to the reading readiness approach, reflects the intertwined knowledge about language, reading and writing that is gained prior to formal literacy and reading instruction (Erickson 2000; Justice and Kaderavek 2004; Whitehurst and Lonigan 1998). Some of this precursor knowledge begins during infancy, but most of it is acquired during the preschool years. Emergent literacy is recognized as a multi-form domain, composed of both inside-out components (e.g., knowledge of letters, links between sounds and letters, syntactic understanding, memory) and outside-in components (e.g., narrative context, semantic concepts, knowledge of writing) anchored in larger language and literacy environments (i.e., home, child care, preschool) (Whitehurst and Lonigan 1998). The causal linkages and correlational connections amongst all these components, environments and subsequent reading and writing are not fully known (cf., Forget-Dubois et al. 2009). However, the evidence for the effects of lower socioeconomic status on early language/literacy opportunities and acquisition is clear (e.g., Catts et al. 1999; Duncan et al. 1994; Hoff-Ginsberg 1998; Justice and Ezell 2001; Lonigan and Whitehurst 1998; Walker et al. 1994; White 1982). Children from lower socioeconomic circumstances enter school less prepared and at greater risk for subsequent reading, writing and academic-achievement difficulties (Campbell and von Stauffenberg 2008; Snow et al. 1998; Senechal and LeFevre 2002).

Using the arts to teach and learn about language and reading has its own considerable history, with an ebb and flow associated with changes in both educational mandates as well as broader views of the purpose and content of schooling. Most of the credible research has focused on older children or adolescents and the effects of arts instruction and experiences on verbal-related academic achievement (Winner and Cooper 2000). Even when younger children have been the target of arts-based interventions, the work and the measurement of outcomes has not utilized a contemporary model of emergent literacy. Despite these historical limitations, there is reasonable evidence that arts-based work of several kinds can influence early language and reading readiness. Large-scale

reviews of arts-based research (Deasy 2002; Horowitz 2004; Rabkin and Redmond 2004; Stevenson and Deasy 2005) indicate that the arts fare equally if not better in relation to school-age children’s academic and social-skill development when contrasted with traditional learning experiences. This evidence is strongest for dramatic arts (Podlozny 2000) but also suggestive for the visual arts (Burger and Winner 2000; but Korn and Associates, Inc. 2007) and dance (McMahon et al. 2003), although the research base for these conclusions is fairly small and nearly non-existent for preschool children. The present investigation begins to fill this particular hole in our knowledge of arts-integrated learning with young children.

PASELA was specifically designed to (a) increase the literacy and arts knowledge and skills of ECE staff and artists through *Art As A Way Of Learning (AWL)* (Pinciotti et al. 2001) professional-development training, and (b) strengthen the ECE curriculum and learning environments by both (i) integrating the arts throughout all content domains and (ii) increasing available arts and literacy resources. Ultimately, PASELA was expected to improve the emergent literacy, arts and school-readiness skills of high-risk preschool children through specific changes in ECE teachers and their classrooms and pedagogical activities.

This ultimate outcome for young children—improvements in young children’s language, literacy and arts skills to ensure readiness for school—was instantiated in two program benchmarks with associated indicators and measurement activities. The first benchmark specified that 80% of children in PASELA would demonstrate improvement in behaviors related to mastery of three of the Pennsylvania Early Learning Standards (in Language and Literacy, Creative Arts, Approaches to Learning), indicated by teacher ratings of children’s learning-related behaviors and performance. The second benchmark specified that 80% of children in PASELA would demonstrate improvements in foundational knowledge of component literacy skills (e.g., receptive vocabulary, alphabet knowledge, print knowledge), indicated by their performance on standardized measurement instruments administered and scored by independent assessors. Both of these benchmarks were also framed and examined as improvements in mean levels of performance on the associated measures. The present article describes the research undertaken to evaluate these predictions within the PASELA program.

Methods

PASELA Sites

Three community-based ECE programs provided implementation sites for PASELA, all on the south side of

Bethlehem, Pennsylvania: (a) 1 preschool classroom in a private, parochial school (PPK) participated for the entire PASELA program; (b) 2 Head Start classrooms (HS) were involved, with 1 class enrolled part-time (i.e., 8 months) and the other full-time (i.e., 12 months); and (c) 4 classrooms (1 older toddlers, 2 preschool, 1 kindergarten) provided by a private, community-based child care organization (CBCC) participated for the entire program. The south side of Bethlehem was characterized by US Census data as containing greater poverty and unemployment, concentrated minority populations, a prevalence of isolated and young female-headed households, and poor educational outcomes (e.g., high school dropout rate >25%).

PASELA Participants

Children

One hundred eighty-one children (aged 3+ years) comprised the PASELA sample for this research (see Table 1); children younger than 3 years old ($n = 88$) were not included in the present sample because of the requirements of the measurement instruments. CBCC and HS each provided about 40% of the total sample, with PPK contributing about 20%. Overall, there were slightly more female (54%) than male children. About half of the children (52%) were of Hispanic ethnicity, although nearly all children (>90%) used English as their primary language, according to their teachers. The vast majority of the children at all sites (76%) were from the south side of Bethlehem. None of these differences in gender, ethnicity, primary language and residence among PASELA sites were statistically significant. There were, however, small but reliable differences ($p < .05$) in the ages of these children as a function of PASELA site (see Table 1). The average age at pre-assessment across all children was approximately 4.5 years (54.2 months), with PPK children somewhat older (57.7 months) and CBCC children somewhat younger (52.1 months). Pre-assessment age differences by PASELA site were maintained at post-assessment. These statistically significant age differences as a function of PASELA site were expected. HS and PPK both drew most of their children from the traditional 4-year-old pre-kindergarten population. However, as a full-service child care provider (infancy to school-age), CBCC was expected to have a larger group of 3-year-olds making their children youngest (on average) at pre-assessment. Although expected, these statistically significant age differences reflect potentially important systematic variability within the PASELA sample.

Artists and ECE Teachers

Twelve artists and 15 ECE teachers participated in PASELA from the outset, although not all remained involved throughout the entire program. The ECE teachers were current employees of the community-based preschool programs described above, while the artists were affiliated with several south-side Bethlehem, community-based arts organizations. Fifty-eight percent of the artists were male, but the ECE teachers were exclusively women. All of the

Table 1 Child descriptive characteristics

	Site							
	PPK		CBCC		HS		All	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender								
Female	20	53	38	54	40	56	98	54
Male	18	47	33	46	32	44	83	46
Ethnicity								
White	6	16	15	21	8	12	29	16
African American	1	3	17	24	9	13	27	15
Hispanic	25	66	27	38	41	59	93	52
Bi/multiracial	2	5	11	16	11	16	24	14
Other	4	11	1	1	0	0	5	2
Primary language								
English	35	92	70	99	68	94	173	96
Non-English	3	8	1	1	4	6	8	4
Residence								
South Bethlehem	12	32	58	82	68	94	138	76
Other Bethlehem	9	24	5	7	0	0	14	8
Other	17	45	8	11	4	6	29	17
Totals	38	21	71	39	72	40	181	100
Age at pre (months)*								
Mean		57.7		52.1		54.4		54.2
SD		7.3		12.6		6.9		9.8
Range		44–73		36–80		39–65		36–80
Age at post (months)*								
Mean		66.6		59.0		58.7		60.7
SD		6.9		12.8		6.9		9.7
Range		53–79		39–82		42–75		39–82

SD = standard deviation

Asterisk (*) denotes statistically significant difference among sites

Age at pre: $F(2,178) = 4.23, p = .016$; PPK > CBCC, $p = .013$

Age at post: $F(2,131) = 8.65, p < .001$; PPK > CBCC, $p = .002$ and HS, $p < .001$

artists except one were White, while only about half of the ECE teachers were White (55%, African American 18%, Hispanic 27%). Artists and teachers were comparable in age (38.7 and 36.2 years, respectively). All of the artists were educated to at least the bachelor's degree and some (36%) possessed a graduate degree, while 25% of ECE teachers possessed a high school diploma and none were educated to a graduate level. Artists had been in their current positions, on average, about 12 years and in their fields longer (mean = 19 years) than the teachers (means = 5 and 10 years, respectively). Teachers, however, had somewhat longer experience (mean = 12 years) in working with young children than did artists (mean = 10 years). The differences between artists and teachers on gender, education level, and experience in the field were all statistically significant ($p < .05$), although it is difficult to know the reliability of the obtained differences due to the small sample size.

PASELA Approach and Program Structures

Approach

Arts integration in PASELA was consistent with Deasy's (2003) general definition as an "...effort to build a set of relationships between learning in the arts and learning in the other skills and subjects of the curriculum" (p. 2), and contained programmatic processes linked to three more specific definitional elements (i.e. (i) learning through and with the arts; (ii) curricular connections; (iii) collaborative engagement; Burnaford et al. 2007). PASELA focused on developing arts-integrated teaching strategies and literacy experiences, enriched aesthetic and literacy environments for children and families, and collaborations among families, artists, educators and citizens to support arts experiences in the community and early school success. These focal points were embedded in a 13-month program (January 2006–February 2007) of professional development for ECE teachers and artists (see below), artist-teacher collaborations in the form of multiple artist residencies (see below), ongoing literacy and arts support in classrooms, infusion of arts- and literacy-related materials, family access to and involvement in community-based arts experiences, as well as participative oversight of PASELA by all its stakeholders.

Art as a Way of Learning (AWL) is a professional development model designed by art educators, classroom teachers, and administrators to integrate the arts into everyday learning in the classroom (Pinciotti and Gorton 1999). Based on a set of guiding principles about learning and teaching, and grounded in research on arts in education, the professional development provides knowledge and skills around (a) increasing artistic literacies in dance,

drama, music and the visual arts; (b) creative collaborations with arts educators and community artists; (c) enhancing the aesthetic environment; and (d) acquiring a repertoire of arts-integrated teaching strategies and assessment tools to support, stretch and inspire student learning.

Professional Development

The professional development of ECE staff and artists contained four layered components. First, there was intensive, multiple-day (30 total hours) pre-service training in AWL conducted by its lead and veteran trainer, focusing on AWL's core principles (i.e., art as language, children using art, art leads learning, teachers guide learning) and components (i.e., artistic literacy, creative collaborations, aesthetic environments, teaching strategies, assessment). Second, there was ongoing training and supervision provided during monthly in-service sessions (2 h each) throughout the remainder of the program to expand and enhance learning from the pre-service training. Third, a literacy/arts coach provided regular, individualized mentoring and consultation to ECE staff and artists at all program sites at least twice per month (with some sites requiring additional visits based on staff needs). The coach's consultation focused on implementing teaching strategies and activities consistent with AWL principles, supporting teacher-artist project collaborations and connecting their work to literacy, as well as enhancing the aesthetic and literacy-related aspects of classroom environments.

Artist Residencies

A fourth component of ongoing professional development involved two different residencies in each ECE setting. PASELA artist residencies were structured as 10-week cycles, with each artist in her/his assigned residency-classroom for 6 h per week (typically 1 day/week). A different artist was scheduled into each classroom's five residencies throughout the program year, and the artists' specializations varied (i.e., visual, theater, music, dance/movement). Across the entire year, all of the residencies were staffed by a total of 10 artists. One musician staffed six residencies (17%) throughout the program, one visual artist and one actor each staffed five residencies (14%), one photographic artist staffed four residencies (11%), and the remaining six artists staffed one to three residencies (3–9%) each. Children's current and ongoing interests drove the actual content of the residencies. Teachers and artists then collaborated on the broad goals for learning and the teaching opportunities and activities to support those goals. This usually resulted in an extended, multi-form, collaborative project (sometimes with multiple sub-projects) by children, artists and teachers over the 10 weeks of the residency. These full spectrum

AWL-based residencies in PASELA were designed explicitly to allow the time, concentration and participation for extended, complex, rich and generative interactions among children, artists and teachers.

In addition to the PASELA artist residencies, a collaborating community-based partner provided its “Curtains Up for Reading” theater-based literacy residency in all PASELA classrooms throughout the year (1 3-h visit/week/classroom). This traditional “perform and go” residency was structured in 8-week cycles and repeated throughout the program year and delivered by one actor to each PASELA classroom. It consisted of multi-sensory activities derived from thematically related story-reading and story-acting opportunities during each residency cycle.

PASELA Evaluation Design

The overall design for the evaluation of PASELA was a quasi-experimental pre-post treatment-only design involving all the participants in the PASELA intervention. Quasi-experimental designs are especially valuable in the early stages of a program’s development, such as PASELA, because they provide (a) a wide scan of the intervention’s content, processes, and context, (b) substantive knowledge about the intervention’s strengths and weaknesses, allowing for fine-tuning of content or processes, and (c) a sense of the potential effects of an intervention prior to the scale-up in dollars and operations required for a rigorous experimental design. Quasi-experimental designs by themselves do not provide definitive information regarding an intervention’s impact. PASELA’s evaluation design organized data collection into a pre phase (near its onset in the classroom) and a post phase (near its completion of classroom work). This overall organization drove measurement activities with the children, centered on the objective of assessing their literacy, arts and school-readiness skills.

PASELA Measurements

An independent assessor administered each of the following standardized measures to children. Get Ready to Read (GRTR; Whitehurst and Lonigan 2003) is a screening tool for measuring early reading skills in young children, specifically print knowledge, linguistic awareness, and emergent writing. As per its instructions, one score (total correct items [0–20]) is derived from this measure for each child, with scores in the 12–16 range indicating readiness for school reading instruction. Peabody Picture Vocabulary Test IIIA&B (PPVT; Dunn and Dunn 1997) is a norm-referenced measure of receptive vocabulary in young children. As per its instructions, a standard score (40–160) was derived from this measure for each child. Test of Early Reading Ability III (TERA; Reid et al. 2001) is a norm-

referenced measure of early reading skills in young children, containing three subtests assessing children’s knowledge of the alphabet, reading conventions, and word meaning. As per its instructions, standards scores (1–20) were derived for each child for each subtest as well as for overall reading (3–60).

The Early Learning Standards Inventory (ELSI; see Appendix) was a 17-item measure created for this project and based on three of the Pennsylvania Early Learning Standards for ECE (i.e., Approaches to Learning [5 items], Creative Arts [4 items], Language and Literacy [8 items]). Each ELSI item contained at least two (and up to 6) statements focused on mastery of specific, age-appropriate learning behavior within the item’s purview; the teacher rated each behavioral statement on its frequency for each individual child (i.e., rarely/never, sometimes, always; scored as 0, 1 and 2, respectively). The score for each ELSI item was a mean of all the behavioral statements for that item. Then four summary scores were derived for this measure by computing means across all the items for each of the three learning domains, as well as an overall mean across the entire instrument.

Data Analyses

Descriptive statistics were computed to depict quantitatively the PASELA samples (child, artists/teachers). Preliminary comparisons (e.g., gender, site) were run on these descriptive data to ensure that there were no unexpected differences in the sample’s composition. Principal analyses were organized and constructed around the predictions in the original objectives and benchmarks. Thus, for example, children were assigned to change groups (i.e., worse, no change, improved) on their pre-post performances on the various literacy measures, and the percentage improved was then compared to the 80% threshold specified in the benchmark. Subsequent analyses were run to compare the actual mean levels of scores on these measures at pre- and post-assessment. Finally, additional analyses were run to evaluate if there were factors that modified or explained differently any obtained pre-to-post findings.

Results

Sample Attrition

There is inevitable sample loss when measurements are undertaken over a period of months. It is incumbent, then, to demonstrate that the participants who were lost to later measurement points were not different in some systematic way from those participants who remained through the entire program period. Children who completed PASELA

(Pre and Post, $n = 149$) were very similar to those who did not (Pre Only, $n = 32$) on gender (female 56 and 44%, respectively), residence (South Bethlehem 75 and 84%), ethnicity (Hispanic 52 and 50%) and age (48.0 and 48.5 months). Also, there were no statistically significant differences between these two groups in performance at pre-assessment on the GRTR (11.9 and 11.5, respectively), PPVT (94.2 and 91.4) and TERA (overall 86.6 and 85.7), as well as teacher ratings on the ELSI (overall 1.3 and 1.1).

There was, however, one important difference between the non-completing and completing groups based on the PASELA site ($\chi^2[2] = 16.0$, $p < .001$). At PPK, nearly identical percentages of Pre Only and Pre & Post children obtained (19 and 22%, respectively). CBCC contributed the largest percentage of Pre-Only children (69%) but only one-third (33%) of completing children, while the opposite pattern obtained for HS (13% Pre Only, 46% Pre and Post). One can speculate without certainty on the sources of this site-based difference in sample attrition (e.g., differences in family movement or in program execution). However, it is clear again that site is a significant factor differentiating experiences of the PASELA program and will need to be considered in understanding the principal findings of this evaluation.

Child Outcomes

ELSI

Children were classified into change groups (decreased, unchanged, increased) if their scores on the post ELSI were less than, the same as, or greater than (respectively) their scores on the pre ELSI. The vast majority of children (70–84%) improved from pre to post on their teacher-rated ELSI performances (see Table 2). The original benchmark (i.e., 80% of children improving) was obtained on both the Language and Literacy (81%) and Overall ELSI (84%) scores, with Approaches to Learning (71%) and Creative Arts (70%) nearly as strong. When actual scores on the ELSI (all 0–2) were evaluated, statistically significant improvements arose on all three ELSI domains as well as the Overall ELSI score (all $t[135] > 9.00$, $p = .001$; see Table 3). The sizes of the pre-post differences were considerable (all $d > .75$; see Table 2), with all four practical effects in the large range (Cohen, 1992). Thus, across the entire sample there was notable improvement in all learning-related behaviors as rated by teachers, and improvements occurred in the majority of children participating in PASELA.

GRTR

Performance on the GRTR was examined in the same ways that the ELSI ratings were handled (i.e., pre-post change

groups, mean performances). Seventy-one percent of children improved on the GRTR (see Table 2), not quite reaching the expected 80% threshold. A somewhat different picture emerged, however, when actual obtained scores were examined. Pre-post improvement on the GRTR (+2.0) was statistically significant ($t[125] = 7.46$, $p = .001$) and of moderate size ($d = .66$). GRTR pre-scores (11.9) were, on average, just below the threshold for reading-instruction readiness (12–16), with average post-scores (14.0) solidly within that range.

PPVT

When change-groups on the PPVT were examined, more than half (56%) improved (see Table 2), although well short of the 80% threshold. The nearly two-point average improvement from pre- (94.1) to post-assessment (96.0), however, did reach statistical significance ($t[123] = 1.99$, $p = .048$; see Table 2) even though small in size ($d = .18$) and within the low-average range.

TERA

Slightly less than half of PASELA children (40–50%) improved on the TERA subtests (see Table 2). When actual performance levels were evaluated, both the Alphabet and Meaning subtests of the TERA yielded statistically significant improvements (+0.5, $t[125] = 2.20$ and +0.6, $t[125] = 2.10$, respectively, both $p < .035$; see Table 2), with a statistical trend toward improvement on the Overall Reading score (+0.9, $t[124] = 1.81$, $p = .073$). All of the effects on the TERA were modest in size ($d = .07$ –.20). As a general rule, average TERA scores (both pre and post) were somewhat below average.

Factors Affecting Child Outcomes

Several statistical analyses were undertaken to evaluate the pre-post improvements based on the group differences already noted about this sample of children (i.e., PASELA site, child age). There were no statistically significant differences on any of the standardized measures as a function of PASELA site, however teacher ratings on the ELSI were significantly different by PASELA site (see Table 3). HS children were rated as most competent, followed to varying degrees by children at CBCC and PPK. Children's performance was also examined separately by their age at pre-assessment (see Table 3). On virtually all measures and at nearly all ages, children improved their pre-post performances. However, there were statistically significant age-related differences on the PPVT, TERA and ELSI. Three- and 4-year-olds both improved significantly more than did 5-year-olds on the PPVT and the TERA. On the

Table 2 Child Outcomes in PASELA

Pre-post change groups								
	Decrease		No change		Increase		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
ELSI								
Approaches	17	12	23	17	99	71	139	100
Creative arts	15	11	26	19	95	70	136	100
Language/literacy#	19	14	7	5	114	81	140	100
Overall#	18	13	4	3	115	84	137	100
GRTR	20	16	16	13	90	71	126	100
PPVT	51	41	4	3	69	56	124	100
TERA								
Alphabet	40	32	23	18	63	50	126	100
Convention	56	45	18	14	51	41	125	100
Meaning	47	37	19	15	60	40	126	100
Overall reading	56	45	14	11	55	44	125	100
Mean performance								
	Pre Mean(SD)		Post Mean(SD)		Diff. Mean(SD)		<i>p</i>	<i>d</i>
ELSI								
Approaches*	1.33 (.57)		1.69 (.37)		+0.35(.45)		.001	.77
Creative arts*	1.26 (.60)		1.68 (.37)		+0.42(.52)		.001	.82
Language/literacy*	1.17 (.56)		1.61 (.40)		+0.43(.46)		.001	.94
Overall*	1.25 (.55)		1.66 (.35)		+0.41(.43)		.001	.95
GRTR*	11.9 (4.5)		14.0 (4.3)		+2.0(3.1)		.001	.66
PPVT*	94.1 (12.6)		96.0 (13.7)		+1.8(10.3)		.048	.18
TERA								
Alphabet*	8.2 (2.9)		8.7 (3.0)		+0.5(2.6)		.030	.20
Convention	7.8 (1.8)		7.7 (2.0)		−0.2(2.2)		n.s.	.07
Meaning*	7.9 (2.4)		8.5 (2.3)		+0.6(3.0)		.029	.20
Overall reading^	23.9 (5.6)		24.9 (5.7)		+0.9(5.8)		.073	.09

SD = standard deviation, Diff. = pre-post difference, *p* = statistical probability level, *d* = effect size

n.s. = non-significant

Pound sign (#) denotes attainment of predicted improvement benchmark (80%)

Asterisk (*) denotes statistically significant (at least *p* < .05) improvement from pre- to post-assessment

Caret (^) denotes statistical trend toward (*p* = .051–.10) significant improvement from pre- to post-assessment

ELSI, 3-year-olds improved nearly significantly more than did both 4- and 5-year-olds.

Finally, child performance was examined as a function of the amount of children's exposure to/participation in PASELA (see Table 3). Although the programmatic ideal was for all children to receive the full dose of PASELA (i.e., 50 weeks/5 residency cycles), the reality was quite different. Indeed, the majority of children (71%) received only a portion of PASELA (i.e., defined as 1–30 weeks/1–3 residency cycles). When actual length of program exposure (in weeks) was evaluated directly, an important difference emerged as a function of PASELA site ($F[2,178] = 9.51$,

$p = .001$). CBCC children (34.6 weeks) participated in PASELA significantly longer than did HS children (25.3 weeks) and marginally longer than PPK children (31.1 weeks). In general, children improved from pre- to post-assessment on all measures and whether they received the whole year (i.e., 31–50 weeks/4–5 residency cycles) or a portion of PASELA programming. However, on both the GRTR and the ELSI there were statistically greater improvements associated with longer participation in PASELA (see Table 3). These latter results are consistent with a dose-response effect in PASELA such that greater exposure to/participation in PASELA yielded greater

Table 3 Significant changes in child performance by PASELA site, child age at pre, and length of program exposure pre post diff

Factor and measure	Pre M(SD)	Post M(SD)	Diff. M(SD)
Analysis by PASELA site			
ELSI*			
PPK	0.83	1.80	+0.9(0.4)
CBCC	1.20	1.50	+0.4(0.4)
HS	1.50	1.70	+0.2(0.3)
Analysis by child age at pre			
PPVT*			
3 years	90.3	96.4	+5.5(10.4)
4 years	94.5	95.7	+3.1(10.0)
5 years	95.4	94.5	-2.9(8.8)
TERA*			
3 years	23.0	25.6	+3.5(5.0)
4 years	24.2	25.6	+1.6(6.5)
5 years	23.4	22.8	-2.2(3.7)
ELSI^			
3 years	0.87	1.40	+0.5(0.4)
4 years	1.30	1.70	+0.4(0.4)
5 years	1.50	1.80	+0.3(0.4)
Analysis by program participation			
GRTR*			
Partial (< 41 weeks)	12.3	14.0	+1.4(3.0)
Whole (> 40 weeks)	10.6	14.1	+3.3(2.7)
ELSI*			
Partial	1.32	1.70	+0.3(0.3)
Whole	0.98	1.60	+0.6(0.5)

M = mean; SD = standard deviation, Diff. = pre-post difference

Asterisks (*) denote statistically significant pre-to-post differences

Site ELSI: $F(2,134) = 36.05$, $p < .001$, PPK > CBCC and HS (both $p < .001$)

Program portion GRTR: $t(124) = (-3.6)$, $p < .001$

Program portion ELSI: $t(135) = (-4.4)$, $p < .001$

Age PPVT: $F(2,121) = 7.07$, $p = .001$, 3-year-olds ($p = .002$) and 4-year-olds ($p = .012$) > 5-year-olds

Age TERA: $F(2,122) = 9.92$, $p < .001$, 3-year-olds ($p = .013$) and 4-year-olds ($p = .008$) > 5-year-olds

Caret (^) denotes statistical trend toward significant difference

Age ELSI: $F(2,134) = 2.58$, $p = .080$, 3-year-olds > 5-year-olds ($p = .078$)

improvements on at least some measures of emergent literacy and school readiness.

Taken together, the results from these additional analyses suggest a potentially complex interplay of factors—length of program exposure, age of child, program site—that might account for the present improvements. A careful, rigorous experimental design will be required to determine confidently PASELA's true impact.

Discussion

We obtained small, but tantalizing improvements on literacy- and learning-related and school-readiness skills among high-risk young children in community-based preschool programs using the PASELA model. These improvements were strongest on the teacher ratings of learning-related mastery (ELSI), but also appeared on several standardized measures administered by independent testers, including two norm-referenced measures (GRTR, PPVT, TERA). In general, the present suggestive results stand up well in comparison to other literacy-related interventions for preschool-aged children (see Justice and Pullen 2003). The improvements obtained within PASELA are also comparable in size to those obtained in another highly regarded intervention program for early literacy but with a science focus (i.e., ScienceStart! 2007).

We believe our findings are especially important for several reasons. First, we worked with young preschool children, while most arts-in-education efforts have focused on older children and adolescents. Second, our effects on children were found despite the brevity of PASELA (i.e., 50 weeks containing five residency cycles in its ideal form). Many arts-in-education programs at the elementary-, middle- and high-school levels produce effects—when they are found at all—only after several years of implementation (Winner and Cooper 2000). Third, our effects occurred using an array of arts experiences (i.e., dramatic, visual, musical, movement/dance) and not just a single arts focus. Finally, our findings were obtained within a real-world population and program context instead of a tightly controlled research experiment.

Our findings can be understood as reflecting achievements within both narrow and broader literacy and learning frameworks during early childhood. The standardized measures we used in PASELA assessed many narrow, inside-out components of emergent literacy (e.g., GRTR's print knowledge and emergent writing; TERA's alphabet knowledge) and fewer of the somewhat broader, outside-in elements (e.g., PPVT's receptive vocabulary, TERA's reading conventions). The ELSI measured broader masteries of specific content learning as well as the child behaviors that support learning as a general mastery process. Nonetheless, PASELA yielded promising results across these multiple levels of literacy and learning. We believe this was accomplished by providing a unique environment in which teachers, artists and children engaged the content of the arts in the service of their understanding, communication and learning.

No matter how intriguing the present suggestive findings appear on their face, several significant qualifications must be acknowledged. First, some of the improvements (i.e., PPVT, TERA) were relatively small, even when

statistically significant and exceeding the expectable age-related changes. Second, statistically significant pre-post effects were also found when these data were examined as a function of (at least) PASELA site, child age at entry and length of program exposure. Unfortunately, all of these variables were systematically distributed—as opposed to randomly distributed—in this sample of children. For example, CBCC had, on average, the youngest children at entry and, correspondingly, the longest exposure to PASELA as well as the largest sample attrition; on the other hand, HS had the oldest children and the briefest exposure to PASELA, as well as the least sample attrition. As a result of these confounding variables, it is impossible to disentangle which (if any) of these effects predominate in the improvements obtained. Finally, without an experimental design it is impossible to know with certainty at this time if the improvements seen in these children are the result of PASELA or one of several alternative explanations (e.g., child maturation, enrollment in preschool, placebo effect). Astute organization of an experimental design with control and/or comparison groups will be necessary in PASELA's next steps to disentangle the complicated effects of site, child age, and length of exposure to PASELA noted previously. As a result of the present quasi-experimental design we are left with findings that are promising and suggestive as opposed to definitive and unassailable.

With these provisos duly noted, the findings from this evaluation nonetheless suggest PASELA's very promising effects on the learning-related, emergent-literacy and school-readiness skills of high-risk preschoolers nearing kindergarten entry. We found salutary and statistically significant improvements in teacher-rated behaviors as well as performances on standardized, norm-referenced measures for these predominantly poor, Hispanic young children. At the very least, these results suggest that PASELA offers an approach to teaching young children that deserves thoughtful review, careful revision and more rigorous testing. Indeed, our next steps include, among other things (a) evaluating PASELA using an experimental design with appropriate methodological controls to allow for confident causal conclusions; (b) continued refinement of the content and structure of PASELA, particularly related to evolving standards for learning in ECE; (c) comparing and correlating PASELA's effects with other models of ECE; and (d) exploring effects on children in other learning competencies than just language and literacy.

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Appendix: Early Learning Standards Inventory

Please read each of the following statements about young children's behavior and learning. Make a judgment as to whether the behavior—right now—is one that you rarely or never see in this individual child (mark 'Never'), sometimes see in this child (mark 'Some'), or something that you see often or all the time in her/him (mark 'Always').

Approaches to Learning

AL1. Initiative and Curiosity

- AL1.1 Participates in a variety of activities
- AL1.2 Makes choices on her/his own
- AL1.3 Is eager and enjoys learning and talking about different topics and ideas
- AL1.4 Explores and learns from environment using different strategies (e.g., play, movement, manipulation)

AL2. Engagement and Persistence

- AL2.1 Persists to finish tasks, activities, projects and experiences
- AL2.2 Able to set goals, develop plans and follow through (e.g., plan, develop, complete construction activity)
- AL2.3 Maintains concentration on a task, question, set of directions, or interactions

AL3. Reasoning and Problem-solving Skills

- AL3.1 Able to predict an effect from its cause (e.g., predicts outcomes in stories or "what if" questions)
- AL3.2 Finds more than one solution to a question, task or problem
- AL3.3 Looks for and/or accepts help when encountering problem
- AL3.4 Solves problems through observing, exploring, trial and error, or interacting with peers or adults
- AL3.5 Classifies, compares and contrasts objects, events and experiences (e.g., piles similar cars together and separate from other vehicles, like trucks)

AL4. Flexibility, Risk-taking and Responsibility

- AL4.1 Can tell the difference between safe and dangerous behaviors or situations
- AL4.2 Tries both familiar and new experiences.
- AL4.3 Participates actively (verbally/nonverbally) in her/his learning experiences (e.g., initiates own learning and play activities)

AL5. Imagination and Invention

AL5.1 Approaches tasks and activities with flexibility, imagination and inventiveness (e.g., uses different types of materials, creates unusual props, etc.)

AL5.2 Solves problems by using materials or strategies in unusual ways

AL5.3 Shows imagination and creativity in play (e.g., makes up new roles, constructs something never seen before)

Creative Arts

CA1. Visual Art Forms for Creative Expression and Representation

CA1.1 Curious about and explores visual materials (e.g., chalk, paints, etc.) and activities (e.g., painting, drawing, weaving)

CA1.2 Expresses thoughts, ideas, emotions and experiences through visual forms (e.g., using different colors for different feelings)

CA2. Expression through Music and Movement

CA2.1 Expresses self through movement (e.g., follows teacher-guided movement activity)

CA2.2 Beginning to understand movement elements and techniques (e.g., tempo, rhythm)

CA2.3 Listens and responds to different forms of music (e.g., hip-hop, jazz, folk tunes, popular)

CA2.4 Demonstrates ability to use movement and music (e.g., sings songs, chants, hops to music)

CA3. Dramatic Play Experiences

CA3.1 Represents fantasy and real-life experiences through pretend play

CA3.2 Participates in teacher-guided dramatic activities

CA3.3 Expresses own ideas through dramatic play

CA3.4 Engages in cooperative pretend play with another child/other children

CA4. Appreciation of Art Forms

CA4.1 Understands and shares opinions about artwork and art experiences

CA4.2 Uses oral language to describe/explain art (e.g., answers questions about own artwork)

CA4.3 Uses different elements of creative art

CA4.4 Recognizes and names a variety of art forms (e.g., drawing, photos, music performance)

Language and Literacy

LL1. Listening and Understanding Skills

LL1.1 Listens attentively to stories and conversations

LL1.2 Follows multi-step directions

LL1.3 Understands new vocabulary introduced in stories, books, activities, or conversations

LL1.4 Recognizes facial expressions, gestures, and body language cues

LL1.5 Responds to questions

LL2. Communicates Ideas, Experiences and Feelings

LL2.1 Speaks clearly enough to be understood by most listeners

LL2.2 Recites rhymes, songs and familiar text

LL2.3 Uses varied vocabulary, sentence structures, and sentence lengths

LL2.4 Talks about her/his own experiences individually or in groups

LL2.5 Begins conversations with adults or children, and responds appropriately

LL3. Comprehends Written and Oral Information

LL3.1 Retells simple story in sequence with or without using illustrations/storybook props

LL3.2 Draws connections between story content and personal experiences or other stories

LL3.3 Recognizes different “tones” of stories (e.g., happy, sad, excited)

LL3.4 Identifies facts in a story

LL3.5 Predicts what will happen in a story based on what is read, discussed, or seen in illustrations

LL4. Phonological Awareness

LL4.1 Recognizes similarities and differences in environmental and speech sounds

LL4.2 Matches sounds/rhymes in familiar words, games, songs, finger plays, stories and poems

LL4.3 Recognizes that 2 (or more) words begin with same sound

LL4.4 Identifies initial sounds in words (e.g., plays with repetitive sounds, like ‘snakes slither slowly’)

LL4.5 Understands speech sounds are represented in print by letter sounds (e.g., attends to books that focus on specific sounds, like *Fox in Socks*)

LL5. Concepts of Print

LL5.1 Recognizes environmental print (e.g., logos, signs)

LL5.2 Identifies a few familiar words in print (e.g., exit, stop, on-off)

LL5.3 Understands that text contains information

LL5.4 Understands that print moves from top to bottom, and left to right

LL5.5 Understands letters form words and words form sentences, and that spaces separate words

LL5.6 Recognizes some conventions of print (e.g., upper/lower case letters, punctuation marks)

LL6. Book Knowledge and Appreciation

LL6.1 Is interested in books, stories read aloud, and other reading-related activities

LL6.2 Has book-handling skills (e.g., holds book upright, flips pages)

LL7. Letter Knowledge

LL7.1 Associates names of letters with their shapes and sounds (e.g., listens to/sings along with ‘ABC’ books or recordings)

LL7.2 Identifies at least 10 letters of the alphabet, especially those in own name

LL7.3 Notices the beginning letters in familiar words (e.g., names of classmates)

LL8. Writing Forms

LL8.1 Uses scribbles to communicate in writing

LL8.2 Uses letters or letter-like forms to express thoughts, feelings and ideas

LL8.3 Writes own name or other meaningful words

LL8.4 Explores letter-sound associations while writing (e.g., produces common signs/logos)

LL8.5 Understands writing serves a variety of purposes (e.g., stories, letter, cards, lists)

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